

# State of Utah

#### **Division of Facilities Construction & Management**

Department of Administrative Services 4110 State Office Building Salt Lake City, Utah 84114 Phone (801) 538-3018 Fax (801) 538-3267

### Addendum #1

Date: Sept 21, 2005

To: Commissioning Consultants

From: Matthias Mueller

Reference: New Health Sciences Building – Dixie State College

DFCM Project No. 05050640;

NO ATTACHMENTS FOR THIS PROJECT

and

New TASS Barracks – Camp Williams, Utah National Guard

DFCM Project No. 95059480

Reference the Attached (26 page document) Army Core of Engineers -

Sustainable Project Rating Tool (SPiRiT)

Subject: Addendum No. 1 (2 pages)

Please acknowledge receipt of this Addendum on a separate sheet to be included with the Commissioning Consultant's management plan, references, statement of qualification, and termination/debarment submittal.

#### 1.1 New TASS Barracks – Solicitation for Consultant Services, Table Of Contents

An electronic copy of the *Sustainable Project Rating Tool (SPiRiT)* document is attached to this addendum via the DFCM's web site.

#### 1.2 <u>New TASS Barracks & New Health Sciences Building – Solicitation for Consultant</u> Services, Project Description, 11. Management Plan

Delete the year "2002" in the first sentence of the third paragraph and replace it with the year "2005".

#### 1.3 New TASS Barracks & New Health Sciences Building - Selection Committee

**Committee Members** 

The following comprise the selection committee for the projects as identified:

David McKay – DFCM, Program Director (both projects)

Ned Carnahan – DSC, Director of Operations (Health Sciences)

Derek Payne – VCBO Architects, Partner (Health Sciences)

Scott Potter – Utah Natl Guard, Engineer (TASS Barracks)

Ron Jones – WPA Architects, Principal (TASS Barracks)

Please contact me at 801.538.3018 if you have justification for changing any members of the selection committee.

#### 1.4 Questions

Question 1: In the Solicitation for Consultant Services for both projects, in the Project Description, 11. Management Plan – in the second paragraph it states that we need to "address risks that have been identified by the SFC (solicitation for consultants)" – can you direct me to the "risks identified"?

**Answer:** No, because we didn't identify any.

Question 2: In the Solicitation for Consultant Services for both projects, in the Project Description, 5. Commissioning Agents Minimum Responsibilities, C.1.h. – it states that the commissioning agent is to coordinate, witness, and document functional tests. Are we to witness the tests as the contractor performs the tests or do we perform the tests ourselves?

<u>Answer:</u> The commissioning agent shall witness the test performed by the installing contractor(s).

**Question 3:** At the mandatory meeting, it was mentioned that travel reimbursement will be allowed for the projects. Please clarify.

<u>Answer:</u> For one or both of the projects, we will negotiate travel reimbursement with the selected commissioning agent, if that agent is not located in the area of or near to the project they will be commissioning. For example, if the selected commissioning agent for the TASS Barracks is located within 100 miles of the project, we will not allow reimbursement for travel and vice versa. Likewise for the Health Sciences Bldg.

**Question 4:** Will all commissioning consultants that registered be invited to interview? **Answer:** Yes.

END OF ADDENDUM #1

# Sustainable Project Rating Tool (SPiRiT)

Version 1.4.1

U. S. Army Corps of Engineers
U. S. Army Assistant Chief of Staff for Installation Management

June 2002

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#### **NOTES**

- 1) This Sustainable Project Rating Tool (SPiRiT) is derived from The U. S. Green Building Council LEED 2.0 (Leadership in Energy and Environmental Design) Green Building Rating System TM.
- 2) The SPiRiT numbering scheme parallels, but does not match LEED 2.0. LEED does not number major sections, which it calls 'Credit Categories,' ex. 'Sustainable Sites,' rather it numbers criteria or 'credits' within each major section. SPiRiT credit numbers match those of LEED where there is a 1:1 comparison. Where additional credits have been added they fall at the end of major sections.
- The SPiRiT Credits all follow the format: Intent, Requirement and Technologies/Strategies.

Intent: A statement of the primary goal for the credit;

Requirement: Quantifiable conditions necessary to achieve stated intent;

<u>Technologies/Strategies</u>: Suggested technologies, strategies and referenced guidance on the means to achieve identified requirements.

4) Projects are evaluated for each SPiRiT credit which are either 'Prerequisites' or result in a point score:

<u>Prerequisites</u>: These credits are a statement of minimum requirements and must be met. No further points will be awarded unless the minimum is achieved. These credits are recognizable by an 'R' in the number scheme, ex. 1.R1, and a 'Reqd.' in the score column.

<u>Point Score</u>: These credits are evaluated and result in a point score. Where the potential score is greater than 1, no partial points are granted.

5) SPiRiT Sustainable Project Certification Levels:

SPIRIT Bronze 25 to 34 Points SPIRIT Silver 35 to 49 Points SPIRIT Gold 50 to 74 Points SPIRIT Platinum 75 to 100 Points

6) SPIRIT credits have been developed to address facility life cycle phases including programming, design, construction, and commissioning. Additional rating tools will be developed to address installation/base master planning and facilities operations and maintenance, rehabilitation, recycling, and disposal.

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- 9) Army/USACE employees are members of the USGBC with membership privileges accessible via the USGBC web site, <a href="http://www.usgbc.org">http://www.usgbc.org</a>. For information on membership and access to available LEED resources to support use of SPiRiT and sustainable design in your projects, contact Richard Schneider at (217) 373-6752 or <a href="mailto:richard.l.schneider@erdc.usace.army.mil">richard.l.schneider@erdc.usace.army.mil</a> (Annette Stumpf at (217) 352-6511 ext. 7542 or <a href="mailto:annette.l.stumpf@erdc.usace.army.mil">annette.l.stumpf@erdc.usace.army.mil</a> alternate).
- 10) For the latest information on SPiRiT and for access to guidance, tools and resources supporting sustainable design initiatives, visit the CERL 'Sustainable Design and Development Resource' website, <a href="http://www.cecer.army.mil/SustDesign">http://www.cecer.army.mil/SustDesign</a>. There you may also join the CERL Sustainable Design ListServ to be directly notified of information pertinent to sustainable design.

1.R1

1.0

# Erosion, Sedimentation, and Water Quality Control

Reqd.

Intent:

Control erosion and pollutants to reduce negative impacts on water and air quality.

Requirement:

- Design a site sediment and erosion control plan and a pollution prevention plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:
  - Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
  - Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
  - Prevent hazardous material discharge into storm water systems.
  - Prevent petroleum oils and lubricants (POL) discharge into storm water systems.

Technologies /Strategies:

The EPA standard lists numerous measures such as silt fencing, sediment traps, oil grit separators, construction phasing, stabilization of steep slopes, maintaining vegetated ground cover and providing ground cover that will meet this prerequisite.

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#### Site Selection (1)

1.C1 Intent:

Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site. Select site based on functional adjacencies/relationships and land use compatibility.

Requirement:

- Do not develop buildings on portions of sites that meet any one of the following criteria:
  - Prime training or maneuver land.
  - Land whose elevation is lower than 5 ft. above the 100-year flood elevation as defined by FEMA.
     Land that provides habitat for any species on the Federal or State threatened or endangered list.
  - Within 100 feet of any wetland as defined by 40 CFR, Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent.
- Select site based on functional adjacencies/relationships and land use compatibility.

1

1

- Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.
- Select site in area of high density.
- Site facilities based on the strength of their relationships to other facilities/land-uses to limit travel distances. The stronger the relationship/functional interaction, the closer the distance between two facilities.
- Select for distance to installation/base transit systems and access to pedestrian ways and bike paths.
- Select for development previously used or developed suitable and available sites.

# Technologies /Strategies:

Screen potential building sites for these criteria and/or ensure that these criteria are addressed by the designer during the conceptual design phase. Utilize landscape architects, ecologists, environmental engineers, civil engineers, and similar professionals for the screening process. New wetlands constructed as part of stormwater mitigation or other site restoration efforts are not affected by the restrictions of this prerequisite.

<sup>(1)</sup> Adapted material not reviewed or endorsed by U. S. Green Building Council.

1.0	Sustainable Sites (Continued)						
1.C2 Intent:	Installation/Base Redevelopment (1) Channel development to installation/base cantonment areas with existing infrastructure, protecting greenfields and preserving habitat and natural resources.						
Requirement:	Increase localized density to conform to existing or desired density goals by utilizing sites that are located within existing cantonment areas of high development density.						
	Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.	1					
Technologies /Strategies:	During the site selection process give preference to previously developed sites with installation/base cantonment redevelopment potential such as facility reduction program cleared sites.						
1.C3	Brownfield Redevelopment (1)						
Intent:	Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.						
Requirement:	Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements OR Develop a brownfield site (a site that has been contaminated by previous uses).	1					
Technologies	Screen potential damaged sites for these criteria prior to selection for rehabilitation.						
/Strategies:	Utilize EPA OSWER Directive 9610.17 and ASTM Standard Practice E1739 for site remediation where required.						
1.C4	Alternative Transportation (1)						
Intent:	Reduce pollution and land development impacts from automobile use.						
Requirement:	□ Locate building within ½ mile of installation/base transit systems.	1					
	Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants.	1					
	☐ Locate building within 2 miles of alternative-fuel refueling station(s).	1					
	Size parking capacity not to exceed minimum installation/base cantonment requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants.	1					
Technologies /Strategies:	Select sites near public installation/base transit served by safe, convenient pedestrian pathways.						

<sup>(1)</sup> Adapted material not reviewed or endorsed by U. S. Green Building Council.

#### Sustainable Sites (Continued) 1.0 Reduced Site Disturbance (1) 1.C5 Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Intent: On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond 1 Requirement: the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation. Reduce the development footprint (including building, access roads and parking) to exceed the 1 installation/base's/base's master plan local zoning's open space requirement for the site by 25% or in accordance with installation/base policy on open space set asides, whichever is greater. Note requirements on plans and in specifications. Establish contractual penalties for destruction of trees and site Technologies areas noted for protection. Reduce footprints by tightening program needs and stacking floor plans. Establish /Strategies: clearly marked construction and disturbance boundaries. Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas. Work with local horticultural extension services, native plant societies, or installation/base agronomy staff to select indigenous plant species for site restoration and landscaping. Stormwater Management (1) 1.C6 Limit disruption of natural water flows by minimizing storm water runoff, increasing on-site infiltration and reducing Intent: contaminants. Requirement: Implement a stormwater management plan that results in: No net increase in the rate or quantity of stormwater runoff from undeveloped to developed conditions: OR. if 1 existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff. Treatment systems designed to remove 80% of the average annual post development total suspended solids 1 (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA-840-B-92-002 1/93). Significantly reduce impervious surfaces, maximize on-site stormwater infiltration, and retain pervious and **Technologies** vegetated areas. Capture rainwater from impervious areas of the building for groundwater recharge or reuse /Strategies: within building. Use green/vegetated roofs. Utilize biologically-based and innovative stormwater management features for pollutant load reduction such as constructed wetlands, stormwater filtering systems, bioswales, bioretention basins, and vegetated filter strips. Use open vegetated swales to reduce drainage velocity and erosion, reduce system maintenance, increase vegetative variety and support wildlife habitat where space permits. Landscape and Exterior Design to Reduce Heat Islands (2) 1.C7 Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize Intent: impact on microclimate and human and wildlife habitat. Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking 1 Requirement: lots, walkways, plazas, etc., OR, use light-colored/ high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space under-ground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area. Use ENERGY STAR Roof compliant, high-reflectance AND low emissivity roofing (initial reflectance of at 1 least .65 and three-year-aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area. Employ design strategies, materials, and landscaping designs that reduce heat absorption of exterior materials. Technologies

/Strategies:

Note albedo/reflectance requirements in the drawings and specifications. Provide shade (calculated on June 21,

noon solar time) using native or climate tolerant trees and large shrubs, vegetated trellises, or other exterior structures supporting vegetation. Substitute vegetated surfaces for hard surfaces. Explore elimination of blacktop

and the use of new coatings and integral colorants for asphalt to achieve light colored surfaces.

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#### Sustainable Sites (Continued) 1.0 Light Pollution Reduction (1) 1.C8 Eliminate light trespass from the building site, improve night sky access, and reduce development impact on Intent: nocturnal environments. Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements as Requirement: stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site. Consult IESNA Recommended Practice Manual: Lighting for Exterior Environments for Commission Internationle Technologies de l'Eclairage (CIE) zone and pre and post curfew hour descriptions and associated ambient lighting level /Strategies: requirements. Ambient lighting for pre-curfew hours for CIE zones range between .01 footcandles for areas with dark landscapes such as parks, rural, and residential areas, and 1.5 footcandles for areas with high ambient brightness such as installation/base areas with high levels of nighttime activity. Design site lighting and select lighting styles and technologies to have a minimal impact off-site and minimal contribution to sky glow. Minimize lighting of architectural and landscape features. Exterior lighting should be consistent with security lighting requirements. **Optimize Site Features** 1.C9 Optimize utilization of the site's existing natural features and placement of man-made features on the site. Intent: 1 Perform both of the following: Requirement: Maximize the use of free site energy. Plan facility, parking and roadways to "fit" existing site contours and limit cut and fill. Evaluate site resources to ascertain how each can enhance the proposed project and visa versa. Work to Technologies maximum advantage of the site's solar and wind attributes. Use landscaping to optimize solar and wind /Strategies: conditions and to contribute to energy efficiency; Locate and orient the facility on the site to optimize solar and wind conditions. Facility Impact 1.C10 Minimize negative impacts on the site and on neighboring properties and structures; avoid or mitigate excessive Intent: noise, shading on green spaces, additional traffic, obscuring significant views, etc. Cluster facilities to reduce impact, access distance to utilities and sufficient occupant density to support mass 1 Requirement: Collaborate with installation/base and community planners to identify and mitigate potential impacts of the 1 project beyond site boundaries, and transportation planners to insure efficient public transport. Involve local/regional planners and community members in installation/base master planning processes. Technologies Recognize the context and the impact of a project beyond site boundaries, and integrate it with the larger /Strategies: installation/base/community context/land use. Site Ecology 1.C11 Identify and mitigate all existing site problems including contamination of soil, water, and air, as well as any Intent: negative impacts caused by noise, eyesores, or lack of vegetation, enhancing or creating new site habitat. 1 Develop site environmental management and mitigation plan. Requirement: Understand site and surrounding ecosystem interdependence and interconnectivity. Plan landscaping scheme to Technologies incorporate biodiversity. Preserve/enhance existing trees, hydrological features, ecosystems, habitats, and /Strategies: cultural resources. Increase the existence of healthy habitat for native species. Reintroduce native plants and

trees where they have been destroyed by previous development.

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2.0	Water Efficiency Score	5
2.C1	Water Efficient Landscaping (2) Limit or eliminate the use of potable water for landscape irrigation.	
Requirement:	Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.	1
	Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems.	1
Technologies /Strategies:	Develop a landscaping water use baseline according to the methodology outlined in the LEED Reference Guide. Specify water-efficient, native or adapted, climate tolerant plantings. High efficiency irrigation technologies include micro irrigation, moisture sensors, or weather data based controllers. Feed irrigation systems with captured rainwater, gray water, or on-site treated wastewater.	
0.00	Innovative Wastewater Technologies (2)	
2.C2 Intent:	Reduce generation of wastewater and potable water demand, while increasing local aquifer recharge.	
Requirement:	Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards.	1
Technologies /Strategies:	Develop a wastewater baseline according to the methodology outlined in the LEED Reference Guide. Implement decentralized on-site wastewater treatment and reuse systems. Decrease the use of potable water for sewage conveyance by utilizing gray and/or black water systems. Non-potable reuse opportunities include, toilet flushing, landscape irrigation, etc. Provide advanced wastewater treatment after use by employing innovative, ecological, on-site technologies including constructed wetlands, a mechanical recirculating sand filter, or aerobic treatment systems.	
2.C3 Intent:	Water Use Reduction (1)  Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.	
Requirement:	Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act (EPACT) of 1992 fixture performance requirements.	1
	Exceed the potable water use reduction by an additional 10% (30% total efficiency increase).	1
Technologies /Strategies:	Develop a water use baseline including all water consuming fixtures, equipment, and seasonal conditions according to methodology guidance outlined in the LEED Reference Guide. Specify water conserving plumbing fixtures that exceed Energy Policy Act (EPACT) of 1992 fixture requirements in combination with ultra high efficiency or dry fixture and control technologies. Specify high water efficiency equipment (dishwashers, laundry, cooling towers, etc.). Use alternatives to potable water for sewage transport water. Use recycled or storm water for HVAC/process make up water. Install cooling tower systems designed to minimize water consumption from drift, evaporation and blowdown.	

June 2002

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#### 3.R1

# Fundamental Building Systems Commissioning (1)

Regd.

Intent:

Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirement:

Implement all of the following fundamental best practice commissioning procedures.

- Engage a commissioning authority.
- Develop design intent and basis of design documentation.
- Include commissioning requirements in the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and documentation.
- Complete a commissioning report.

Technologies /Strategies:

Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Perform additional commissioning in accordance with the DOE Building Commissioning Guide, Version 2.2. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional commissioning guides. Specify pre-occupancy baseline IAQ testing at time of commissioning. Test for indoor air concentrations of CO, CO2, total VOCs and particulates. Test to assure that adequate ventilation rates have been achieved prior to initial occupancy.

3.R2

#### Minimum Energy Performance (1)

Reqd.

Intent:

Establish the minimum level of energy efficiency for the base building and systems.

Requirement:

Design to meet building energy efficiency and performance as required by TI 800-01 (Design Criteria).

Technologies /Strategies:

Use building modeling and analysis techniques to establish and document compliance. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Refer to the LEED Reference Guide for a wide variety of energy efficiency strategy resources.

Use a professionally recognized and proven computer program or programs that integrate architectural features with air-conditioning, heating, lighting, and other energy producing or consuming systems. These programs will be capable of simulating the features, systems, and thermal loads used in the design. Using established weather data files, the program will perform 8760 hourly calculations. BLAST, DOE-2 or EnergyPlus are acceptable programs for these purposes.

3.R3 Intent:

# CFC Reduction in HVAC&R Equipment (2)

Regd.

Reduce ozone depletion.

Requirement:

Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Technologies /Strategies:

Specify only non-CFC-based refrigerants in all base building HVAC&R systems.

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# 3.0 Energy and Atmosphere (Continued)

#### 3.C1

# Optimize Energy Performance (1)

Intent:

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirement:

- Reduce design energy usage (DEU) compared to the energy use budget (EUB) in joules per square meter per year for regulated energy components as described in the requirements of Chapter 11 of the TI 800-01 (Design Criteria), as demonstrated by a whole building simulation.
  - 1 Point will be awarded for every reduction in design energy use of 2.5% for both new and existing facilities for a maximum score of 20 points.

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

# Technologies /Strategies:

Develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Perform interactive energy use analysis for selected design elements that affect energy performance and document compliance.

Unit of measure for performance shall be annual energy usage in joules per square meter. Life-Cycle energy costs shall be determined using rates for purchased energy, such as electricity, gas, oil, propane, steam, and chilled water and approved by the adopting authority. Refer to the LEED Reference Guide or Whole Building Design Guide for a wide variety of energy efficiency resources and strategies including conservation measures, electromechanical energy efficiency technologies (for example ground-source heat pumps), passive heating and cooling strategies, solar hot water, and daylighting.

Life-Cycle costing will be done in accordance with 10 CFR 436.

Consider installation of an Energy Management and Control System (EMCS), which is compatible with exiting installation systems to optimize performance. Use sensors to control loads based on occupancy, schedule and/or the availability of natural resources use (day light or natural ventilation).

#### 3.C2

#### Renewable Energy (1)

Intent:

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

#### Requirement:

Supply a net fraction of the building's total energy use through the use of on-site renewable energy systems.

#### % of Total Annual Energy Usage in Renewables

5%

10%

15%

20%

Technologies /Strategies:

Employ the use of on-site non-polluting-source renewable technologies contributing to the total energy requirements of the project. Consider and use high temperature solar and/or geothermal, photovoltaics, wind, biomass (other than unsustainably harvested wood), and bio-gas. Passive solar, solar hot water heating, ground-source heat pumps, and daylighting do not qualify for points under this credit. Credit for these strategies is given in Energy & Atmosphere Credit 1: Optimizing Energy Performance.

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2

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#### Energy and Atmosphere (Continued) 3.0

3.C3

Additional Commissioning (2)

Intent:

Verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.

Requirement:

- In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks:
- 1. Conduct a focused review of the design prior to the construction documents phase.
- 2. Conduct a focused review of the construction documents when close to completion.
- 3. Conduct a selective review of contractor submittals of commissioned equipment.
- 4. Develop a system and energy management manual.
- 5. Have a contract in place for a near-warranty end or post occupancy review.

Items 1, 2, and 3 must be performed by someone other than the designer.

Technologies /Strategies:

Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional guidelines.

<< Deleted >> (1)

3.C5

3.C4

Measurement and Verification (1)

Intent:

Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement:

- Comply with the installed equipment requirements for continuous metering as stated in selected Measurement and Verification Methods - Option B: Retrofit Isolation of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following:
  - Lighting systems and controls.
  - Constant and variable motor loads.
  - Variable frequency drive (VFD) operation.
  - Chiller efficiency at variable loads (kW/ton).
  - Cooling load.
  - Air and water economizer and heat recovery cycles.
  - Air distribution static pressures and ventilation air volumes.
  - Boiler efficiencies.
  - Building specific process energy efficiency systems and equipment.
  - Indoor water risers and outdoor irrigation systems.

Technologies /Strategies:

Design and specify equipment to be installed in base building systems to allow for comparison, management, and optimization of actual vs. estimated energy and water performance. Employ building automation systems to perform M&V functions where applicable. Tie contractor final payments to documented M&V system performance and include in the commissioning report. Provide for ongoing M&V system maintenance and operating plan in building operations and maintenance manuals. Consider installation/base of an Energy Management and Control System (EMCS), which is compatible with exiting installation/base systems to optimize performance.

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# 3.0 Energy and Atmosphere (Continued)

3.C6

Green Power (1)

Intent:

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirement:

Engage in a two year contract to purchase the amount of power equal to projected building consumption generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements.

1

Technologies /Strategies:

Purchase power from a provider that guarantees a fraction of its delivered electric power is from net nonpolluting renewable technologies. Begin by contacting local utility companies. If the project is in an open market state, investigate Green Power and Power Marketers licensed to provide power in that state. Grid power that qualifies for this credit originates from solar, wind, geothermal, biomass, or low-impact hydro sources. Low-impact hydro shall comply with the Low Impact Hydropower Certification Program.

3.C7

**Distributed Generation** 

Intent:

Encourage the development and use of distributed generation technologies, which are less polluting than grid-source energy.

Requirement:

Reduce total energy usage and emissions by considering source energy implications and local cogeneration and direct energy conversion. Generate at least 50% of the building's projected annual consumption by onsite distributed generation sources.

1

Technologies /Strategies:

Investigate the use of integrated generation and delivery systems, such as co-generation, fuel cells, microturbines and off-peak thermal storage.

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#### Storage & Collection of Recyclables (1) Read. 4.R1 Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills. Intent: Provide an easily accessible area that serves the entire building that is dedicated to the separation, Requirement: collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals. Establish a waste management plan which meets requirements of the installation/base environmental and/or solid Technologies waste management plans in cooperation with users to encourage recycling. Reserve space for recycling /Strategies: functions early in the building occupancy programming process and show areas dedicated to collection of recycled materials on space utilization plans. Broader recycling support space considerations should allow for collection and storage of the required elements and newspaper, organic waste (food and soiled paper), and dry waste. When collection bins are used, bin(s) should be able to accommodate a 75% diversion rate and be easily accessible to custodial staff and recycling collection workers. Consider bin designs that allow for easy cleaning to avoid health issues. Building Reuse (1) 4.C1 Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and Intent: reduce environmental impacts of new buildings as they relate to materials manufacturing and transport. Reuse large portions of existing structures during renovation or redevelopment projects. Requirement: Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window 1 assemblies). Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing 1 excluding window assemblies). Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling 1 systems). Evaluate retention of existing structure. Consider façade preservation, particularly in installation/base areas. Technologies During programming and space planning, consider adjusting needs and occupant use patterns to fit within existing /Strategies: building structure and interior partition configurations. Identify and effectively address energy, structural, and indoor environmental (lead & asbestos) issues in building reuse planning and deconstruction documents. Percentage of reused non-shell building portions will be calculated as the total area (s.f.) of reused walls, floor covering, and ceiling systems, divided by the existing total area (s.f.) of walls, floor covering, and ceiling systems. Construction Waste Management (1) 4.C2 Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back Intent: to the manufacturing process. Develop and implement a waste management plan, quantifying material diversion by weight: Requirement: Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land dearing waste. Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris. Develop and specify a waste management plan which meets requirements of the installation/base environmental Technologies and/or solid waste management plans that identifies licensed haulers and processors of recyclables; identifies /Strategies: markets for salvaged materials; employs deconstruction, salvage, and recycling strategies and processes, includes waste auditing; and documents the cost for recycling, salvaging, and reusing materials. Source reduction on the job site should be an integral part of the plan. The plan should address recycling of corrugated cardboard, metals, concrete brick, asphalt, land clearing debris (if applicable), beverage containers, clean dimensional wood, plastic, glass, gypsum board, and carpet; evaluate the cost-effectiveness of recycling rigid insulation, engineered wood products and other materials; hazardous

materials storage and management; and participation in manufacturers' "take-back" programs to the maximum extent possible. Refer to the LEED Reference Guide for guidelines and references that provide waste management plan development and implementation support including model bid specifications.

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#### 4.0 Materials and Resources (Continued)

4.C3 Resource Reuse (2)

Intent: Extend the life cycle of targeted building materials, reducing environmental impacts related to materials

manufacturing and transport.

1

Specify salvaged or refurbished materials for 10% of building materials.

1

# Technologies /Strategies:

Commonly salvaged building materials include wood flooring/ paneling/cabinets, doors and frames, mantels, iron work and decorative lighting fixtures, brick, masonry and heavy timbers. See the LEED Reference Guide for calculation tools and guidelines. Determine percentages in terms of dollar value using the following steps:

- 1. Calculate total dollars\* (see exclusions) of the salvaged or refurbished material.
- 2. Calculate total dollars (see exclusions) of all building materials.
- 3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: In total dollar calculations, exclude; labor costs; all mechanical and electrical material and labor costs; and project overhead and fees. \*If the cost of the salvaged or refurbished material is below market value, use replacement cost to estimate the material value, otherwise use actual cost to the project.

#### 4.C4 Recycled Content (1)

Intent:

Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.

Requirement:

- Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.
  - ed **1**

1

Specify an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.

# Technologies /Strategies:

Specify building materials containing recycled content for a fraction of total building materials. Select products and materials with supporting information from the AIA Resource Guide or the EPA Environmentally Preferable Purchasing (EPP) Program. Common building materials and products with recycled content include; wall, partition, and ceiling materials and systems; insulation; tiles and carpets; cement, concrete, and reinforcing metals; structural and framing steel. For products/materials not listed, selection should be made on the basis of EPP criterion and/or:

- Toxicity;
- Embodied energy;
- Production use of water, energy and ozone depleting substances (ODSs);
- Production limits on toxic emissions and effluents;
- Minimal, reusable or recycled/recyclable packaging;
- Impact on indoor environmental quality (IEQ);
- Installation that limits generation of waste;
- Materials that limit waste generation over their life;
- EPA guideline compliance; and
- Harvested on a sustainable yield basis.

See the LEED Reference Guide for a summary of the EPA guidelines and calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

- 1. Calculate total dollars (see exclusions) of the material that contain recycled content.
- 2. Calculate total dollars (see exclusions) of all building materials.
- 3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs, all mechanical and electrical material and labor costs, project overhead and fees)

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#### Materials and Resources (Continued) 4.0 Local/Regional Materials (2) 4.C5 Increase demand for building products that are manufactured locally, reducing the environmental impacts Intent: resulting from transportation, and supporting the local economy. Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 1 Requirement: Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or 1 recovered within 500 miles. Specify and install regionally extracted, harvested, and manufactured building materials. Contact the state and Technologies local waste management boards for information about regional building materials. See the LEED Reference /Strategies: Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following 1. Calculate total dollars (see exclusions) of material that is locally or regionally manufactured. 2. Calculate total dollars (see exclusions) of all building materials. 3. Divide Step 1 by Step 2 to determine the percentage. Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees. Rapidly Renewable Materials (2) 4.C6 Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly Intent: renewable materials. Specify rapidly renewable building materials for 5% of total building materials. 1 Requirement: Rapidly renewable resources are those materials that substantially replenish them-selves faster than traditional Technologies extraction demand (e.g. planted and harvested in less than a 10 year cycle) and do not result in significant /Strategies: biodiversity loss, increase erosion, air quality impacts, and that are sustainably managed. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps: 1. Calculate total dollars (see exclusions) of materials that are considered to be rapidly renewable. 2. Calculate total dollars (see exclusions) of all building materials. 3. Divide Step 1 by Step 2 to determine the percentage. Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees. Certified Wood (2) 4.C7 Encourage environmentally responsible forest management. Intent: Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council Requirement: guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

Technologies

/Strategies:

Refer to the Forest Stewardship Council guidelines for wood building components that qualify for compliance to

the requirements and incorporate into material selection for the project.

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#### 5.R1

#### Minimum IAQ Performance (1)

Regd.

Intent:

Establish minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.

Requirement:

Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Technologies /Strategies:

Include proactive design details that will eliminate some of the common causes of indoor air quality problems in buildings. Introduce standards into the design process early. Incorporate references to targets in plans and specifications. Ensure ventilation system outdoor air capacity can meet standards in all modes of operation. Locate building outdoor air intakes (including operable windows) away from potential pollutants/contaminant sources such as sporulating plants (allergens), loading areas, building exhaust fans, cooling towers, sanitary vents, dumpsters, vehicular exhaust, and other sources. Include operational testing in the building commissioning report. Design cooling coil drain pans to ensure complete draining. Include measures to control and mitigate radon buildup in areas where it is prevalent. Limit humidity to a range that minimizes mold growth and promotes respiratory health.

#### 5.R2

# Environmental Tobacco Smoke (ETS) Control (2)

Regd.

1

Intent:

Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirement:

Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Technologies /Strategies: Prohibit smoking in the building and/or provide designated smoking areas outside the building in locations where ETS cannot reenter the building or ventilation system and away from high building occupant or pedestrian traffic.

#### 5.C1

#### IAQ Monitoring (1)

Intent:

Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.

Requirement:

Install a permanent carbon dioxide (CO<sub>2</sub>) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.

Technologies /Strategies:

Install an independent system or make  $CO_2$  monitoring a function of the building automation system. Situate monitoring locations in areas of the building with high occupant densities and at the ends of the longest runs of the distribution ductwork. Specify that system operation manuals require calibration of all of the sensors per manufacturer recommendations but not less than one year. Include sensor and system operational testing and initial set point adjustment in the commissioning plan and report. Also consider periodic monitoring of carbon monoxide (CO), total volatile organic compounds (TVOCs), and particulates (including PM10).

<sup>(1)</sup> Adapted material not reviewed or endorsed by U. S. Green Building Council.

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#### Increase Ventilation Effectiveness (2) 5.C2 Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety, and Intent: comfort. 1 For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness Requirement: (E) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy. Employ architectural and HVAC design strategies to increase ventilation effectiveness and prevent short-circuiting Technologies of airflow delivery. Techniques available include use of displacement ventilation, low velocity, and laminar flow /Strategies: ventilation (under floor or near floor delivery) and natural ventilation. Operable windows with an architectural strategy for natural ventilation, cross ventilation, or stack effect can be appropriate options with study of inlet areas and locations. See the LEED Reference Guide for compliance methodology guidelines. Construction IAQ Management Plan (2) 5.C3 Prevent indoor air quality problems resulting from the construction/renovation process, to sustain long term Intent: installer and occupant health and comfort. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy Requirement: phases of the building as follows: During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning 1 National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999). Conduct a minimum two-week building flushout with new filtration media at 100% outside air after 1 construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445. Specify containment control strategies including protecting the HVAC system, controlling pollutant sources, Technologies interrupting pathways for contamination, enforcing proper housekeeping and coordinating schedules to minimize /Strategies: disruption. Specify the construction sequencing to install absorptive materials after the prescribed dry or cure time of wet finishes to minimize adverse impacts on indoor air quality. Materials directly exposed to moisture through precipitation, plumbing leaks, or condensation from the HVAC system are susceptible to microbial contamination. Absorptive materials to protect and sequence installation include; insulation, carpeting, ceiling tiles, and gypsum products. Appoint an IEQ Manager with owner's authority to inspect IEQ problems and require mitigation as necessary. Low-Emitting Materials (2) 5.C4 Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and Intent: occupant health and comfort. Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as Requirement: follows: Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 1 by, AND all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51. Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements. Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Composite wood or agrifiber products must contain no added urea-formaldehyde resins. 1 Evaluate and preferentially specify materials that are low emitting, non-irritating, nontoxic and chemically inert. Technologies Request and evaluate emissions test data from manufacturers for comparative products. Ensure that VOC limits /Strategies: are clearly stated in specifications, in General Conditions, or in each section where adhesives, sealants, coatings, carpets, and composite woods are addressed.

(Continued)

Indoor Environmental Quality (IEQ)

5.0

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#### 5.0 Indoor Environmental Quality (IEQ) (Continued)

# 5.C5 Intent: Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality. Requirement: Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs. Technologies Design to physically isolate activities associated with chemical contaminants from other locations in the building,

# Technologies /Strategies:

Design to physically isolate activities associated with chemical contaminants from other locations in the building, providing dedicated systems to contain and remove chemical pollutants from source emitters at source locations. Applicable measures include eliminating or isolating high hazard areas; designing all housekeeping chemical storage and mixing areas (central storage facilities and janitors closets) to allow for secure product storage; designing copy/fax/printer/printing rooms with structural deck to deck partitions and dedicated exhaust ventilation systems; and including permanent architectural entryway system(s) to catch and hold particles to keep them from entering and contaminating the building interior.

Consider utilization of EPA registered anti-microbial treatments in carpet, textile or vinyl wall coverings, ceiling tiles or paints where microbial contamination is a concern. Utilize "breathable" wall finishes where circumstances require, to reduce moisture build-up and prevent microbial contamination. Minimize selection of fibrous materials, e.g. insulation, carpet and padding and flexible fabrics, whose exposed surfaces when exposed to the air stream or occupied space can contribute significant emissions and absorb and re-emit other contaminants over time.

# 5.C6 <u>Controllability of Systems</u> (2)

Intent: Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.

Requirement: Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall.

Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas.

# Technologies /Strategies:

Provide individual or integrated controls systems that control lighting, airflow, and temperature in individual rooms and/or work areas. Consider combinations of ambient and task lighting control and operable windows for perimeter and VAV systems for non perimeter with a 1:1: 2 terminal box to controller to occupant ratio.

# 5.C7 Thermal Comfort (2)

Intent: Provide for a thermally comfortable environment that supports the productive and healthy performance of the

building occupants.

Requirement: Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.

Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building.

#### Technologies /Strategies:

Integrated envelope and HVAC system design strategies that achieve thermal comfort conditions based on mean radiant temperature, local air velocity, relative humidity, and air temperature. Install and maintain a temperature and humidity monitoring system for key areas of the building (i.e., at the perimeter, and spaces provided with humidity control). This function can be satisfied by the building automation system. Specify in system operation manuals that all sensors require quarterly calibration. Include criteria verification and system operation in commissioning plan and report.

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#### Indoor Environmental Quality (IEQ) (Continued) 5.0 Daylight and Views (2) 5.C8 Provide a connection between indoor spaces and the outdoor environment through the introduction of sunlight Intent: and views into the occupied areas of the building. Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space 1 Requirement: occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight. Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, 1 storage areas, mechanical, laundry, and other low occupancy support areas. Implement design strategies to provide access to daylight and views to the outdoors in a glare-free way using Technologies exterior sun shading, interior light shelves, and /or window treatments. Orient buildings to maximize daylighting /Strategies: options. Consider shallow or narrow building footprints. Employ courtyards, atriums, clerestory windows, skylights, and light shelves to achieve daylight penetration (from other than direct effect or direct rays from the sun) deep into regularly occupied areas of the building. Acoustic Environment /Noise Control 5.C9 Provide appropriate acoustic conditions for user privacy and comfort. Intent: Minimize environmental noise through appropriate use of insulation, sound-absorbing materials and noise Requirement: source isolation. Evaluate each occupied environment and determine the appropriate layout, materials and furnishings design. Technologies /Strategies: Facility In-Use IAQ Management Plan 5.C10 Insure the effective management of facility air quality during its life. Intent: Perform all of the following: Requirement: Develop an air quality action plan to include scheduled HVAC system cleaning. Develop an air quality action plan to include education of occupants and facility managers on indoor pollutants and their roles in preventing them. Develop an air quality action plan to include permanent monitoring of supply and return air, and ambient air at the fresh air intake, for carbon monoxide (CO), carbon dioxide (CO 2), total volatile organic compounds (TVOCs), and particulates (including PM10). Provide action plan for periodic system maintenance, monitoring, occupant/manager training. Technologies

/Strategies:

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#### Score **Facility Delivery Process** 6.0 **Holistic Delivery of Facility** 6.C1 Encourage a facility delivery process that actively engages all stakeholders in the design process to deliver a Intent: facility that meets all functional requirements while effectively optimizing tradeoffs among sustainability, first costs, life cycle costs and mission requirements. Choose team leaders that are experienced in holistic delivery of facilities. 1 Requirement: Train the entire team in the holistic delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and design/engineering team members. 1 Identify project goals and metrics. 1 Plan and execute charrettes with team members at critical phases of the facility delivery. Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charrettes and other collaborative processes. Document required results for each phase of project deliverables that achieve the project goals and are 1 measurable throughout the facility life span. Develop performance specifications or choose competitive range of products that meet environmental criteria. **Technologies** /Strategies: Use automated modeling and analysis tools to assess site and facility design alternatives. Conduct life-cycle cost analysis (LCCA) in the design process according to the Federal Facilities Council Technical Report, Sustainable Federal Facilities: A Guide To Integrating Value Engineering, Life Cycle Costing, and Sustainable Development, FFC # 142, 2000. Conduct a full ecological assessment to include soil quality, water resources and flows, vegetation and trees, wildlife habitats and corridors, wetlands, and ecologically sensitive areas to identify the least sensitive site areas for development. Evaluate space utilization/functions to reduce overall space requirements, considering networking, flextime, flexi-place, dual-use, and other strategies to reduce space requirements/optimize facility

provided in the future, nearby facility. Provide ventilation air in sufficient volume free from natural and man made

contaminants.

	Facility Points Summary		:			
1.0	Sustainable Sites (S)			Score	0	Max 20
1.R1	☐ Erosion, Sedimentation and Water Quality Control					[Required]
1.C1	☐ Site Selection					2
1.C2	☐ Installation/Base Redevelopment					2
1.C3	□ Brownfield Redevelopment				-	1
1.C4	<ul> <li>Alternative Transportation</li> </ul>					4
1.C5	☐ Reduced Site Disturbance				<b> </b>	2
1.C6	☐ Stormwater Management				<b></b>	2
1.C7	<ul> <li>Landscape and Exterior Design to Reduce Heat Islands</li> </ul>					2
1.C8	☐ Light Pollution Reduction				ļ	1 1
1.C9	Optimize Site Features					2
1.C10	☐ Facility Impact				<b></b>	1
1.C11	☐ Site Ecology				·	[i
2.0	Water Efficiency (W)	:	!	Score	0	Max 5
2.C1	□ Water Efficient Landscaping					2
2.C2	<ul> <li>Innovative Wastewater Technologies</li> </ul>					1
2.C3	□ Water Use Reduction				<u> </u>	2
3.0	Energy and Atmosphere (E)	i i	:	Score	0	Max 28
3.R1	☐ Fundamental Building Systems Commissioning					[Required]
3.R2	☐ Minimum Energy Performance					[Required]
3.R3	☐ CFC Reduction in HVAC&R Equipment					[Required]
3.C1	<ul> <li>Optimize Energy Performance</li> </ul>					20
3.C2	☐ Renewable Energy					4
3.C3	<ul> <li>Additional Commissioning</li> </ul>					1 .
3.C4	< <deleted>&gt;</deleted>					4
3.C5	<ul> <li>Measurement and Verification</li> </ul>					1
3.C6	☐ Green Power					1
3.C7	Distributed Generation					· ·
4.0	Materials and Resources (M)			Score	0	Max 13
4.R1	☐ Storage & Collection of Recyclables					[Required]
4.C1	☐ Building Reuse					3
4.C2	☐ Construction Waste Management					2
4.C3	Resource Reuse					2
4.C4	Recycled Content					2
4.C5	Local/Regional Materials					1
4.C6 4.C7	<ul><li>Rapidly Renewable Materials</li><li>Certified Wood</li></ul>					1
5.0	Indoor Environmental Quality (IEQ) [Q]			Score	0	Max 17
	Minimum IAQ Performance					[Required]
5.R1	Environmental Tobacco Smoke (ETS) Control					[Required]
5.R2 5.C1	☐ IAQ Monitoring					1
5.C2	☐ Increase Ventilation Effectiveness					] 1
5.C2 5.C3	Construction IAQ Management Plan					2
5.C3 5.C4	Low-Emitting Materials					4
5.C5	☐ Indoor Chemical and Pollutant Source Control					1
5.C6	☐ Controllability of Systems					2
5.C7	☐ Thermal Comfort				****	2
5.C8	□ Daylight and Views					2
5.C9	□ Acoustic Environment /Noise Control					1
5.C10	☐ Facility In-Use IAQ Management Plan				<b></b>	1

and the second second	Facility Points Summary (Continued)		•		Maximum Points
6.0	Facility Delivery Process (P)		Score	0	Max 7
6.C1	☐ Holistic Delivery of Facility				7
7.0	Current Mission		Score	0	Max 6
7.C1 7.C2	<ul><li>Operation and Maintenance</li><li>Soldier and Workforce Productivity and Retention</li></ul>				3 3
8.0	Future Missions		Score	0	Max 4
8.C1 8.C2	<ul><li>Functional Life of Facility and Supporting Systems</li><li>Adaptation, Renewal and Future Uses</li></ul>				2 2
		То	tal Score	0	Max 100
	SPiRiT Sustainable Project Certi	fication Levels			:
		SPIRIT Bronze		25 to 3	84 Points
		SPiRiT Silver		35 to 4	l9 Points
		SPIRIT Gold		50 to 7	74 Points
		SPiRiT Platinum		75 to 1	00 Points
Project	Points of Contact	f y			
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#### **SPiRiT Comment Sheet**

Please forward any comments that you may have on this Sustainable Project Rating Tool, preferably by Email, to:

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